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Forecasting the Experience of Future Entertainment Technology: “Interactive Storytelling” and Media Enjoyment

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Abstract

Advances in gaming and other entertainment technologies are evolving rapidly and create new conceptual challenges for understanding and explaining the user experiences they can facilitate. The present article reports a prospective study on a particularly promising entertainment technology of the future: Interactive storytelling (IS). Integrating various streams of computing technology, such as advanced visualization, natural speech processing, and autonomous agents, IS systems are envisioned to offer new, personalized and thus unique kinds of entertainment to mass audiences of the future. The authors refer to existing models of media entertainment for a theoretical analysis and analyze expert interviews with members of the international IS development community to lay out the foundations for a forecast model of the entertainment experience of future IS systems. The resulting model organizes

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fundamental requirements, modes of users' information processing, and specific types of (pleasant) experiences, which holds implications for (future) entertainment theory and research that accompanies further development of IS media.

Keywords

entertainment, future entertainment systems, interactivity, storytelling, narrative, media enjoyment, expert study

The rapid evolution of digital games and their convergence with other entertainment technologies is coming along with diverse theoretical challenges for media and communication scholars on a regular basis (Ip, 2008; Vorderer & Bryant, 2006). User responses and experiences in interactive entertainment media are a field of games research that is particularly affected by technological and creative progress. For instance, industry advances such as powerful stationary game consoles for the living room and mobile gaming devices (from Nintendo's "Game Boy"® to Apple's "iPad"®) have triggered conceptual reasoning on spatial issues, gamer behavior, and gaming experiences (e.g., Parikka & Suominen, 2006). While scholars in popular culture are often addressing "hot topics" in the gaming domain very early, communication research and media psychology have been relatively slow in noticing the growing importance of video games in general and in covering the quick progress of games technology, philosophies, genres, cultures, and conditions of fun (Vorderer & Bryant, 2006). Consequently, communication research on interactive media entertainment is often "late" and fails to explore recent innovations from a theoretical and an empirical point of view. What is known on the dimensions and determinants of interactive media enjoyment is therefore rarely "up to date."

The present article tries to overcome the time lag between innovations in games art and technology on one hand and entertainment research on the other hand. We address the issue of enjoyment experiences that are to be expected from a *future* type of interactive entertainment that is not yet available to mass markets. Our prospective analysis uses the case of a recent stream of innovation that academic computer science labs and corporate development units are working on and that is hoped to once more revolutionize the gaming landscape: Interactive Storytelling. The label "*Interactive Storytelling*" (IS) is commonly used to describe the vision for future computer-based entertainment systems (e.g., Cavazza, Pizzi, Lugin, & Charles, 2007). In brief, IS technology is envisioned to offer unique entertainment experiences to users by enabling them to actively engage in a meaningful storyline, to shape it according to individual decisions and preferences, and to interact with computer-controlled characters in a human-like, authentic way (e.g., Cavazza, Charles, & Mead, 2002).

IS systems represent integrations of several streams of technology development, such as advanced visual display and animation, autonomous agents, and artificial

intelligence that is required to generate a specific version of the story according to user inputs at run time. Momentarily, this technological vision has become manifest only in prototypes tested in scientific and corporate laboratories, with some elements being already exploited by recent video games (e.g., “Fahrenheit,” Atari, 2005; “F.E.A.R.,” Vivendi Universal, 2005; “Heavy Rain,” Quantic Dream, 2010). With various active research units worldwide and a growing, vivid IS community, however (e.g., Aylett, Lim, Louchart, Petta, & Riedl, 2010), it is likely that entertainment mass media of the future will include the vision of IS. That would essentially be a single-user experience that results from individual interaction with an intelligent and complex system. Forecasting the user experience of IS media is thus a challenging task, as it implies to generate assumptions that can be reviewed (and tested) at later stages once the envisioned IS media have been brought to market. It also allows creating new starting points for theorizing interactive entertainment, which is in need of elaboration and expansion (Sherry, 2004; Vorderer, 2000).

In order to arrive at an IS entertainability model, we apply two distinct methodologies. First, we will pursue a strictly conceptual approach, where we select, from established entertainment models, theoretical notions that seem especially relevant to IS environments. Second, we will apply an expert interview methodology, to find out whether the aims and expectations of IS experts coincide with the theoretical notions proposed earlier. Based on both methodologies, we will tentatively propose an IS entertainability model in the discussion section of this article. We will start, however, by giving a brief introduction of the IS concept.

IS as Entertainment Technology of the Future

Interactive Storytelling can be defined as the endeavor to develop new media in which the presentation of a narrative, and its evolution, can be influenced, in real time, by the user (Cavazza et al., 2007). While in conventional narrative the author maintains exclusive control over what happens, what characters do and say (e.g., arrangement and order of events is critical to suspense in mystery stories, cf. Knobloch-Westerwick & Kepplinger, 2006), IS technology reallocates some of this control to the user and allows her to him to influence the events that occur in the story. Consequently, the linearity of the narrative experience shifts toward a structure where fixed story elements predefined by the author can be arranged/rearranged and shaped continuously by the user. Various metaphors are being used to describe the coconstruction of narrative by author and user, such as interactive drama (Dow, Mehta, Harmon, MacIntyre, & Mateas, 2007) or “Dramatic Presence” (Kelso, Weyhrauch, & Bates, 1993).

The beginnings of IS technology can be traced back to the first attempts to use *Artificial Intelligence* techniques for story generation (Murray, 1997; Young, 2000). It is applied either to automatic plot generation (by processing user interventions) or to guiding the behavior of virtual actors that respond to user input. The use of Artificial Intelligence is the key technology that is envisioned to support

scalability and possibly long-term “mass production” of Interactive Narrative, because if a computer can process the evolution of a story autonomously, systems can be delivered to mass audiences that create a unique, personalized (entertainment) experience. Such a mass medium will to a certain extent be comparable to contemporary adventure computer games (and other genres involving narrative, cf. Lee, Park, & Jin, 2006; Schneider, Lang, Shin, & Bradley, 2004), yet much more sophisticated in terms of user agency and plot flexibility. It is notable that the inclusion of artificial intelligence separates IS from hypertext narrative (Pope, 2010). While the latter operates with premanufactured text elements that users can navigate among individually, IS aims at constructing the progress of a narrative based on user inputs (such as questions or actions taken within a virtual environment) and not only based on hypertext navigation decisions.

Many specific projects on IS media technology assign attention to *dialogue*, whether it takes place between synthetic actors or between the user and these actors as a means to support user interaction. One widely recognized prototype of Interactive Narrative, *Façade* (Mateas & Stern, 2002), is largely based on dialogue and operates plot evolution through dialogic actions among two autonomous characters and the human user of the system. Just as most conventional narrative is driven by characters, they play an important role in IS—this time, however, characters are designed to be interactive, that is, responsive to what users do or say. In order to create an entertaining user experience, such interactive characters should be believable or convincing in the sense that they can react to user interventions in an affectively, socially, and culturally meaningful way.

In addition to including elements from literature and video games, IS prototypes typically integrate components from film. The unfolding story is mostly (yet not always) conveyed in a visual mode, which requires an interactive type of cinematography. Users’ perspective on story events must be managed, either in a director-style where the system decides which perspective onto which events is generated for the users, or in a customized way where users control the visual perspective by themselves. With cinematography, the aesthetic element of IS entertainment media is emphasized; the interactivity creates new challenges for media technology in this respect as well, as conventional visual techniques (e.g., slow-motion, close-ups) need to be aligned with what a given user is actually doing within the story (e.g., Pickering & Olivier, 2003).

A final important element of IS systems design is innovative authoring. From an author’s perspective, the vision of IS entertainment comes with the challenge of inventing new ways of thinking about narrative. In noninteractive entertainment, authors exploit their full control about media content (and the temporal order of that content) to maximize audience enjoyment, for instance, by eliciting surprise or suspense (see next section). IS, however, implies that authors *share* control over what is happening in the story and when it is happening with individual users. Interactive stories need dynamic components that can be “filled” by user influence in order to result in a meaningful, coherent, and enjoyable narrative. So in addition to the

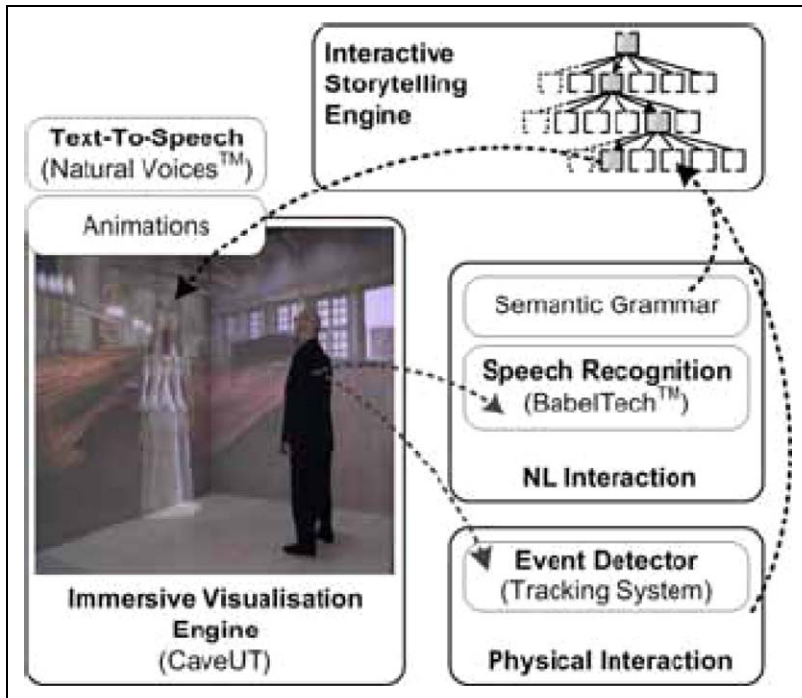


Figure 1. An example of contemporary IS technology (a system developed and tested at University of Teesside, UK.
source: Cavazza et al., 2007).

integration of advanced computing technologies, the IS community is searching for and exploring new ways of designing and “packaging” narrative content (Spierling & Szilas, 2009).

In sum, the vision of how IS media will function is similar to the science-fiction idea of the “Star Trek Holodeck” (e.g., Murray, 1997), that is, users are confronted with an immersive environment and actively participate in an ongoing, meaningful story. Figure 1 gives an example of how contemporary IS technology is composed. Once a sound integration of the diverse pieces of technology (display technology, input devices, autonomous characters, cinematography, etc.) has been achieved in conjunction with intelligent story authoring, IS systems may offer entertainment similar to a virtual theater stage where the user is a protagonist among various intelligent characters—however, the script is incomplete and needs to be shaped by the user. Such systems may come to specific entertainment venues (such as cinemas) or—more likely—may be sold as consumer electronics for home entertainment. One plausible scenario predicts the evolving of video games (e.g., the role-playing genre) with IS technologies, so that future home video games include “deep” IS.

Theoretical Perspective: Linking Entertainment Theory to IS

While the actual design of IS-based future entertainment media is not yet clear, it is likely that the capacity of such systems to facilitate media enjoyment will be grounded on the specific synthesis of technology and content elements that have already been studied in conventional media entertainment. In order to predict the entertainability of IS, or in other words, to forecast which kinds of enjoyable experiential qualities IS technology will primarily facilitate, it is therefore a reasonable conceptual approach to review existing models in entertainment research and to develop perspectives on how IS may facilitate (identical, similar, altered) manifestations of media enjoyment that are already well known.

Interestingly, the available literature on what is entertaining in media entertainment is quite diverse, because researchers from different disciplines and methodological approaches have addressed the topic. For instance, notions of “linear” entertainment have been advanced in film studies (e.g., Tan, 1994). Approaches to digital game players’ fun have evolved in game design and research on game design (e.g., Crawford, 2003; Koster, 2004). The academic field of Game Studies has advanced concepts of play experiences. And communication science and media psychology have also begun to expand their conceptual repertoire to model (interactive) entertainment experiences (e.g., Sherry, 2004; Vorderer, Klimmt, & Ritterfeld, 2004; Tamborini, Bowman, Eden, Grizzard, & Organ, 2010). Our approach mostly builds on the latter body of literature, which however connects easily to many ideas from game design, game studies, and other streams of thinking about media entertainment (for instance, Csikszentmihalyi’s [1990] concept of flow has been addressed across a variety of fields and communities, see below). This perspective understands media enjoyment as “a complex construct that includes references to physiological, affective, and cognitive dimensions” (Vorderer et al., 2004, p. 389), and identifies a variety of important manifestations of enjoyment, which can also be applied to the present case of IS. Following the technological description of the key elements of IS systems presented earlier, several conceptual approaches in communication theory to past and present media entertainment emerge as potentially useful building blocks for a forecast model of the IS experience.

Curiosity

Curiosity is a state that users of conventional media entertainment experience very frequently. Reading a novel, for instance, generates knowledge of characters and situations, which allows readers to conclude what may happen next, what should happen next, and what is likely to happen next (e.g., Knobloch, Patzig, Mende, & Hastall, 2004). Good writers attract readers’ interest, which includes the motivation to learn about what will happen next. In conventional entertainment, curiosity occurs

in various modes. For instance, in video games, curiosity may refer to the progress of the story, but also to the action possibilities that players can try out (“What will happen if I do this?”). During movie consumption, curiosity may also refer to artistic or formal issues rather than the faith of the characters (e.g., “How will the director visualize this?”).

Because various genres of media entertainment build on curiosity so frequently, it is likely that curiosity is pleasant in itself and thus contributes to overall appreciation. Several theorists argue for a psychophysiological base of the pleasantness of curiosity (e.g., Berlyne, 1960). When curiosity occurs, users (viewers, players, etc.) first perceive a state of uncertainty, which comes along with increased physiological activation. To the extent that this uncertainty is not too strong, most users seem to enjoy such (temporary) activation (Berlyne, 1960). When uncertainty is reduced (e.g., readers turn the page and find out what actually happens next), users experience a sense of closure or completion, which renders the increased physiological activation a positive, pleasant experience (Zillmann, 1996a). If the state of curiosity is followed by a surprise (i.e., something unexpected happens), these affective user responses often turn into exhilaration (Zillmann, 2000). Entertainment media that generate circles of increased curiosity and resolved curiosity thus create a chain of pleasant affective dynamics. Because curiosity is a future-focused emotional state (i.e., it is driven by expectations and thoughts about events to come rather than events that already happened), curiosity holds a unique potential to bind sustained user engagement in a media experience.

Such curiosity experiences are likely to be key to the user experience in IS, as IS systems combine multiple dimensions to which user curiosity can refer: Users can be curious about the pre-scripted story progress (“What will happen next?”), interactive story progress (“What will happen if I decide this way?”), character dialogue (“How will this agent respond if I start cursing?”), or technological capacity of the system (“How will the system visualize my view into this tunnel?”). Because IS systems can trigger mechanisms of curiosity at various levels, a high frequency and intensity of curiosity-based affective dynamics in users is likely to occur. Consequently, curiosity is proposed from a theoretical perspective as an integral element of entertainment experiences in IS experiences.

Suspense

A common mode of media enjoyment in conventional entertainment (such as crime drama) is suspense (Vorderer, Wulff, & Friedrichsen, 1996). This experiential state is fueled by aversive emotional components, such as anxiety or empathic concern (e.g., a viewer fearing the defeat of a movie protagonist; cf. Zillmann, 1996b). Suspense differs from curiosity in the sense that users experiencing suspense have a strong interest in a specific outcome of a story episode, such as “My character must win the fight.” In contrast to curiosity, suspense is rooted in emotional involvement with characters. This emotional interest makes users long for specific outcomes and

generates the concern that these specific outcomes may not occur. Therefore, suspense is a rather stressful mode of entertainment.

However, if the desired outcomes occur, strong experiences of relief and satisfaction occur in most cases (“happy end”; Zillmann, 1996a). Research in media psychology suggests that both the aversive stage of suspense and the rewarding relief contribute to user enjoyment (Knobloch, 2003; Vorderer et al., 1996).

Suspense has been found to occur both in linear entertainment such as novels and in interactive media such as video games (Klimmt, Rizzo et al., 2009). In interactive media experiences, suspense is frequently a by-product of challenge and competition—players of competitive video games feel a high level of uncertainty about whether they will master a current challenge or not while they hold a very strong preference to win. Challenge and competition can thus foster similar affective user responses as character-driven emotions (empathy) do in linear entertainment.

IS systems are likely to facilitate suspense as well. More precisely, IS applications can establish emotional involvement with characters and situations (e.g., Paiva et al., 2004). They may simultaneously generate a perception of personal challenge in users. For example, an interactive crime drama may situate the user in the role of a police detective who is facing the climax confrontation with the villain. At this moment, suspense should be high for narrative reasons (as stakes are high in terms of plot development) and for interactivity reasons (as the user must make the “right” decisions to succeed in the confrontation). Therefore, suspense is theorized as second key dimension of the user experience in IS systems.

Aesthetic Pleasantness

Aesthetics are an important element in media entertainment and have been studied extensively in various fields (e.g., Shusterman, 2003; Thorburn, 1987). Interestingly, communication science has neglected the aesthetics element in theories of media enjoyment (Cupchik & Kemp, 2000). Enjoyable aesthetic experiences can have diverse manifestations, such as responses to the physical appearance of characters, landscape imagery, or romantic episodes; they may also relate to attributes that constitute a media application as a piece of art. For example, movie experts may find the cinematic implementation of a special scene “beautiful.” Aesthetic pleasantness shares physiological and cognitive roots with curiosity and suspense (Berlyne, 1960), yet it is shaped to a stronger degree by individual factors (biography, sense of taste, social status, and of course the creativity involved in the medium), and is not necessarily bound to uncertainty reduction. In many cases, aesthetic appreciation is linked to users’ construction of personal meaning from a story or piece of art (Rowold, 2008).

Given the importance of aesthetics in conventional entertainment and the fact that IS technology is addressing users’ senses with impressive information density and richness (Cavazza et al., 2007), it is likely that IS systems can have profound

aesthetic impact on their users. The quality of this aesthetic experience may differ across applications: Some prototypes may facilitate affective responses through “beautiful” imagery (e.g., digital landscapes). Other applications may address users’ aesthetic perception with creative plot development, character attributes, dialogue evolution, or puzzle tasks (e.g., as in the *Myst*TM video games). The element of “deep,” intellectually challenging narrative is certainly key to the aesthetics of IS (e.g., Cavazza et al., 2007). Character attribute, dialogue and language output, music and visual effects, camera movement and cuts may also play an important role, so the expectable performance of future IS systems to engage their users aesthetically is very strong and manifold. Aesthetic pleasantness is therefore proposed as third key dimension of IS media’s entertainability.

Self-Enhancement

Several scholars argue that interactive entertainment media are enjoyed partly because they allow users to experience lifts of self-worth and self-esteem. Most importantly, video games demand task performance from players and provide positive feedback in the case of success, which is conceptually linked to bolstered self-esteem, pride, and associated positive emotions (e.g., Klimmt, Blake, Hefner, Vorderer, & Roth, 2009). Another mode of how video games can affect player self-worth is identification (Klimmt, Hefner & Vorderer, 2009). Identifying with a game character allows to feel like somebody one desires to be, such as a hero, a rock musician, or a powerful decision maker. Fulfilling desires of being like one wants to be generates positive emotions (such as pride), and this response of reduced self-discrepancy has been linked to video game enjoyment (Bessiere, Seay, & Kiesler, 2007).

To the extent that IS systems facilitate identification with characters and/or provide experiences of competence and success, they are also likely to lift users’ self-esteem in a similar fashion as video games do. Because users are directly involved in the story, they can attribute positive events to themselves (e.g., they manage to solve a case in interactive crime drama). Interactivity thus opens the pathway to users’ self-enhancement. Positive self-experiences of reduced self-discrepancy and/or competence and success (self-enhancement) are therefore concluded as fourth theoretically important dimension in the user experience of future IS systems.

Optimal Task Engagement (“Flow”)

Several scholars have applied the concept of “flow” (Csikszentmihalyi, 1990) to study media enjoyment, particularly in the context of interactive media (e.g., Cowley, Charles, Black, & Hickey, 2008; Nakatsu, Rauterberg & Vorderer, 2005; Sherry, 2004). Users experiencing flow find themselves resolving a sequence of tasks that is exactly as difficult as they can handle if they work with full dedication, and this experiential state (in the middle between boredom and anxiety) is found highly pleasant in many situations.

Participating in an interactive story by making decisions and pushing a plot line forward can be construed as a task-type of activity, especially since all IS systems impose rules and limits to what users can decide on and do. Shaping a storyline while complying with such limitations may feel like resolving tasks—just as playing adventure video games requires users to solve puzzles to move the story forward. If the timing and difficulty of users' participation in the development of the story is "right," users may "dive into" the activity of giving input, or, more generally speaking, in co-narrating the story. Flow may thus turn out as an experiential dimension important to users of sophisticated well-structured IS systems that provide reasonable challenges and defined tasks to their audience (e.g., Mallon & Webb, 2005).

Conclusion

The theoretical analysis reviewed the existing conceptual literature on media entertainment to identify dimensions of media enjoyment that are likely to play a role in the user experience of the emerging art and technologies of IS. The resulting five types of experiences (curiosity, suspense, aesthetic pleasantness, self-enhancement, and flow) suggest that the enjoyment of future IS media can possibly be deconstructed and analyzed by referring to well-known contemporary modes of enjoyment. However, this approach may fail to develop a vision of how precisely these potentially relevant dimensions of enjoyment will be *combined* in IS. So truly innovative and unique user experiences may occur in IS systems that cannot be explained in terms of the existing concepts and models. Moreover, the theoretical analysis may fall short of what kind of user experiences the actual designers and authors of interactive stories and their technical platforms intend to create. A solid forecast of the entertainability of future IS media should therefore not only apply the rather conservative strategy of linking existing models of media enjoyment to new technologies but also take a prospective viewpoint and examine practitioners' experiences with existing IS prototypes and visions for future systems. Combining the theoretical approach pursued so far with an expert-oriented empirical methodology is thus proposed as viable strategy to improve the conceptual forecast of IS media's entertainability.

An Expert Interview Study on Designers Envisioned User Experiences in IS

Research Objective

The purpose of the conducted study was to confront the conceptual perspectives developed previously (see above) on the user experience in IS with expert views. Specialists involved in theorizing, planning, and/or implementing IS systems clearly hold their own views of what users (should) experience, and these views may or may not match with the conceptual approach developed in advance, for instance, due to different disciplinary viewpoints or practical experiences that certain modes of

entertainment simply “don’t work.” Therefore, the expert interview study was intended to provide empirical information that enrich, complete, adjust, or even correct the dimensions of IS system users’ entertainment experience derived from the theoretical analysis. The research question that guided the study thus reads as follows:

Research Question: Which kinds of enjoyable user experiences do designers and authors intend to facilitate in users of contemporary and anticipated future systems of interactive storytelling?

Method and Expert Sample

Based on the conceptual reflections (see previous section), a qualitative interview study was designed that focused on three rather broad, open questions which addressed the experts’ views on the user experience in IS. Broadness of the questions was chosen as interviewing strategy because of the heterogeneity of approaches pursued in the technical implementation of IS and the variance in experts’ domain of research (e.g., intelligent agents versus cinematography).

The first question was “According to your experience with Interactive Storytelling projects, prototypes, and visions, how would you describe the feelings or experiences that authors and makers of IS systems intend to facilitate in the users?” The question framed the topic of user experience from a phenomenological or psychological perspective. To ensure that all experts (especially those with a strong background in computing technology) would be able to respond accurately, the second main question framed the topic of the user experience rather from the perspective of system elements required to make users experience the interactive story the way they should do: “Which design elements of IS systems do you regard critical and/or particularly difficult in facilitating such user experiences?” Finally, the third major question attempted to collect experts’ abstraction of what they perceive to be important trends in IS that will endure beyond today’s state of the art: “In which ways do you expect IS systems of the near future (5 to 10 years) improve in terms of facilitating user experiences? How will the IS user experience of the future be?”

A multistep strategy was pursued to generate a sample of internationally recognized experts in IS. First, a significant group of European experts involved in a research network on IS was visited for a workshop event. These experts are active in various subfields of IS and responded to the interview questions in a group discussion that was audiorecorded and analyzed subsequently. Second, a list of further interesting designers and authors was compiled with the help of the members of this expert group. These additional individuals were contacted via electronic mail and invited to participate in the interview study through e-mail responses to the open-ended questions described above. E-mail turned out as suboptimal channel to address experts and conduct the interviews, however, as response rates and durations were quite dissatisfying. Consequently, a third step was taken with a revised list of interview candidates (following additional literature examinations and desktop research), and experts from

this list were invited to a telephone interview. With this procedure, much better response rates and times were achieved, and the number of qualified experts whose views could be processed for the study was increased significantly. One interview was conducted face-to-face, and the respondent preferred not to run an audio recording (which was done for all other interviews). From this single interview, only interviewer notes (instead of a transcription of the expert's actual statements) could be analyzed.

With these recruiting measures, a sample of 20 experts from various countries (e.g., Austria, France, Germany, Switzerland, United Kingdom, United States) participated in the study, who represent a significant amount of practical knowledge of the field and the most advanced IS projects. Because virtually all experts preferred to remain anonymous, no personal citation will be offered when original verbal material is presented in the results section. Analysis of the interview and discussion transcripts began with an open reading to assess the experts' general perspective on the issue of user experience. Subsequently, the processing of transcripts focused on the identification of terms and descriptions related to user experience. Specifically, statements that (1) mirror theorized categories of user experience (see theory section of this article) or (2) mark specific, new, and/or unexpected dimensions of the user experience in IS were examined in detail.

Results

Most experts found it very difficult to connect their view to a specified psychological construal of what the users will think, feel, and experience when they are exposed to an IS medium. The main reason for this discrepancy between the communication science perspective pursued at the theoretical level and the IS experts' perspective is that highly diverse IS systems can be (and have been) designed; just as different types of conventional narratives can foster varying types of emotions in readers, there is no single or typical user experience in interactive narrative.

You can imagine any range of emotions coming through. . . . I do not think there is a general way to evaluate these experiences because they are going to be so varied in nature. (Expert No. 17)

One major reason why the interviewed experts were skeptical about a definable set of important experiential qualities in users of IS systems is that with adding interactivity to the narrative, a high degree of individualized or personalized experience is implied. Because users are enabled to contribute actively to the progress of a story, the story that results from the interaction of a given user and a given system is not necessarily comparable to what comes out as the story if another user interacts with the same system or if the same user interacts with the same system once again.

The story can adapt as the player or the user moves through it. So from an author's perspective, what an author wants to know is what is the landscape, what is the space

of stories, and what are the differences as the user progresses through different story parts, how would that experience be changing their emotional state. (Expert No. 14)

In spite of this in-built multiplicity of user states in IS, experts mentioned some types of user experience as general principles of user involvement. Interestingly, they did so mostly because the interviewer suggested such modes as examples, and not because they regarded them as common sense among system designers. Several experts reflected on the interrelated aspects of *curiosity*, *suspense*, and *surprise* as relevant user experience, because they allow motivating the user to stay with the system and the experience.

Surprise and suspense are in effect for us results of cognitive processes that happen when a user experiences a narrative. (Expert No. 14)

Obviously surprise is interesting as a tool. I would see these emotions as the tools, the high level tools of the author. (Expert No. 18)

Experts mentioned different objects to which curiosity, surprise, and suspense can relate in IS, and not all of them refer to the actual narrative content, but also to the exploration of the capabilities and boundaries of the underlying technology. This finding converges with the conceptual review of curiosity and suggests that novelty of the whole idea of IS adds to the experience at least of present and near-future systems: Aside of curiosity about how the story will or may develop, users are interested and curious about what the technology can do and how it may respond to “silly” user action.

[Some users] engaged at that level that the authors intended or other people were a lot more playing around the edges, trying to break the system, trying to find out where the constraints are, I guess, where the edges of the interaction are. And had fun sort of poking around, saying things that were maybe inappropriate, playing with the graphics, playing with the objects in the space, just messing around. (Expert No. 17)

Another fundamental principle of user experience in IS that was found in expert statements is the perception of actually exercising an *impact* on the story or the story world. Experts stated the requirement to make visible to users what the consequences of their decisions, choices, and actions are. The important aspect is, according to experts, not so much a sense of achievement or self-enhancement (as had been theorized beforehand), but rather the salience of users' own impact on the story. In media psychology, the term *effectance* has been proposed for this experiential dimension (Klimmt & Hartmann, 2006). One notion experts utilize to describe this aspect is “impact,” the other is “choice”—the choices offered to users need to be meaningful in the sense that users notice the consequences of their decision among the options of choice.

You have the feeling that your action . . . has some impact . . . contrary to games where you for example have a smaller circle of cause and effect, . . . in a narrative it can be that your action in fact has an effect but in the . . . future. (Expert No. 7)

I want the user to have a feeling that he is not choosing among a prewritten set of plan sheets, you want to have the feeling that it is not something that has been written but generated . . . the situation is something that I have created as a user. (Expert No. 6)

The final specified type of user experience that experts brought up is *identification* and/or *empathy* with digital characters. Interestingly, statements from different experts mirror a debate in media psychology on “old entertainment” media about the question whether viewers (users) occupy the role of an observer (and thus merely empathize with characters) or rather identify with characters (and thus perceive themselves to be or to be like the displayed character, cf. Klimmt, Hefner & Vorderer, 2009). IS environments seem to allow both types of experiential quality, that is, *empathy* and *identification*:

How coherent must the behavior of the characters be before people recognize that they are behaving coherently; sort of motivational consistencies in characters, how important is that for interactive narrative. (Expert No. 15)

I thought was a particularly interesting case, there is . . . systems that go the full-blown strong identification, trying to by virtual identification immerse the user in some strong emotional responses. So the system I am currently working on, . . . , there they wanted really strong identification, because in fact they wanted to engender the same kinds of emotional responses in the user that the user would have if they would actual make these decisions [in reality]. (Expert No. 15)

Much of experts’ reasoning on the facilitation of entertaining user experiences in IS addressed technological requirements that a system should or must meet before any intended user state can occur. This referred to fundamental issues in system usability—users need to understand how to shape a story with the given interface, for instance. Character believability was also mentioned across several interviews; the characters in interactive narrative should behave authentically according to a convincing personality (e.g., a shy character should respond to a user who talks friendly differently from an assertive character) and process users’ actions and statements in a “natural” way with smooth and error-free dialogue.

There is a sort of naturalness element of the dialogue and whether the user is in that dialogue. It’s the sort of extent to which pace like their contribution is in the same pace as the system. (Expert No. 4)

Discussion

The brief summary of the expert interviews revealed the partial discrepancy between a user-centered approach that follows entertainment theory and media psychology on one hand and the (dominating) technology-centered perspective of how to engage

users in IS experiences on the other hand. At the current stage of technology development, it seems that designers are more concerned about functioning ways to integrate the various pieces of technology to form a coherent, working, holistic experience rather than thinking about the actual kind of entertainment they are about to create. In fact, many responses suggested that the experts consider their projects still at a stage of experimentation and do not yet go for narrowly defined user experiences.

With this limitation, it turned out useful to confront the conceptual account of the user experience in IS with expert views. Some theoretical considerations mirrored expert perspectives; most importantly, curiosity, suspense, and surprise were found important in expert statements just as in the conceptual approach. However, the self-enhancement dimension that had been theorized in advance was not mentioned by experts. Instead, they brought up the effectance issue, which is theoretically linked to self-enhancement (Klimmt & Hartmann, 2006).

Overall, the experts' advice was to lift the conceptual perspective up in terms of abstraction. Because IS systems can vary greatly in content, and because technology development has not yet resulted in many finished systems that can serve as specific exemplars, diverse kinds of user experiences that may not match to the theoretical categories elaborated in advance are possible, so the forecast of IS media's entertainability that expert notions allow would be more general in nature and focus on technological facilitators of experiences instead of actual experiential qualities of given users.

Conclusion: A Forecast Model of Future Entertainment Experiences Based on Interactive Narrative

The present study has applied theoretical analysis and expert interviews to elaborate predictions on how the entertainment experience of the future should be described and explained. Specifically, the question how new communication technologies—IS systems—will shape the user experience was addressed. Both the examination of existing entertainment models and the consultation of IS experts produced valuable insights that can be synthesized in a forecast model of entertainment experiences in users of interactive narratives. One important general finding is that from an expert point of view, the kind of entertainment that IS will deliver to mass audiences is far from being decided on. Further progress in technology integration and the evolution of authorship for interactive stories will have strong influence on how finished IS media will generate audience appeal.

While this does not prevent us from deriving a conceptual model of the future user experience in IS, the results of the expert study remind us of the tentativeness of such a “very early” forecast model.

The model is composed of three structural elements. Following the expert perspective, the first element is fundamental requirements that a system must meet to facilitate *any* meaningful and potentially pleasant user experience. These requirements refer to

technology issues and authoring issues: On the technological dimension, system usability (Shackel, 2009) is identified as fundamental requirement. Once the users feel comfortable with the interface and find the overall appearance of and interaction with the system convincing and error-free, specific modes of processing the interactive story content can unfold (see below). On the authoring dimension, character believability (including naturalness of dialogue) is proposed as the key requirement, because if an IS system would fail to evoke a sense of intentionality and rationality in its characters or would display chaotic dialogues, any illusion-based mode of experience that roots in emotional involvement would be prevented. Character believability is also a technological challenge (Riedl & Stern, 2006), but in contrast to basic system usability, it also involves “intelligent” authoring and narrative creativity. So in addition to smooth user-system interaction (in terms of interface, etc.), a fundamental system requirement is that (authorial) character design is sufficient to stimulate social perception in users and interactions that are free of irritations.

The second part of the conceptual model contains users’ immediate and basic responses to interactive stories that meet the fundamental requirements identified above. System usability and the resulting smooth and immediate interaction between user and story is predicted to evoke the experience of effectance (i.e., salience of one’s impact and consequential decisions, cf. Klimmt & Hartmann, 2006). Character believability is proposed to stimulate emotional responses to characters (most importantly: empathy, cf. Zillmann, 2006) and/or identification with a story protagonist (Klimmt, Hefner & Vorderer, 2009; Oatley, 1994). The model also predicts system usability to affect these emotional responses, because if usability problems overshadow the social experience of interacting with the (believable) characters, the emergence of social-emotional reactions is very unlikely. Vice versa, character believability is also assumed to affect the experience of effectance, because only if the story’s characters respond in an authentic, “rational” way to users’ inputs (e.g., questions), users will develop a sense of having a meaningful and predictable impact onto the story.

Within the overall logic of the model, effectance and empathy/identification are basic user responses that function as mediators that link technology and narrative fundamentals to more complex and specific kinds of user experience, which is the third model component. Following the theoretical analysis and related comments by the experts, curiosity, suspense, surprise, and flow are proposed as typical experiential qualities in IS users. However, IS systems may facilitate many other kinds of experience depending on narrative content, such as exhilaration (Zillmann, 2000), sadness (Oliver, 1993), or discomfort (as in “Façade”: Mateas & Stern, 2002). Therefore, the third model section includes an “open” field that mirrors IS systems capability to generate diverse kind of (pleasant and unpleasant) user states. Figure 2 summarizes the model.

Key to this model proposition is the mediating function of effectance and emotional responses to story characters between the communication technologies and content on one side and the actual user experience of the other side. Effectance is the mechanism that facilitates user experiences out of system interactivity (because

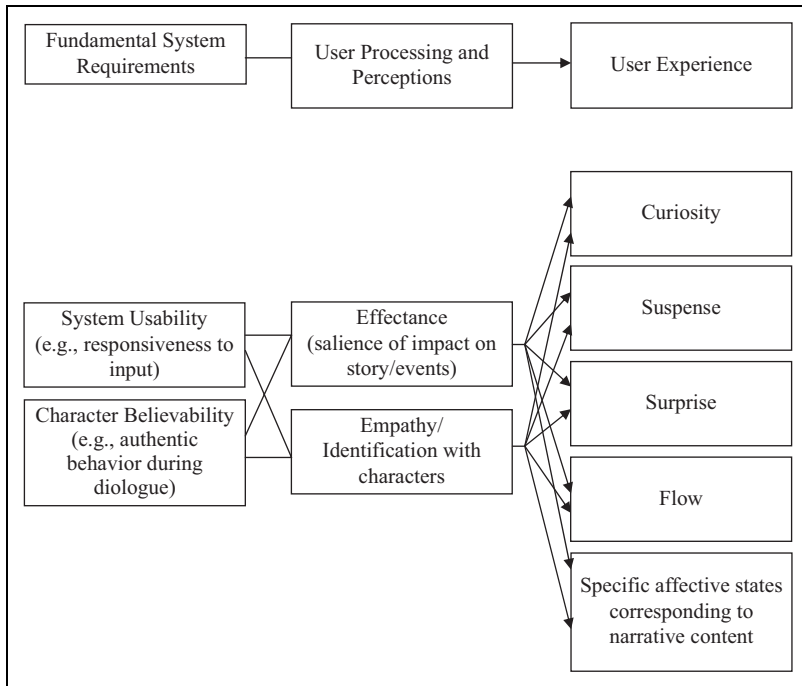


Figure 2. A forecast model of (enjoyable) user experiences in future entertainment media based on interactive storytelling

it marks users' perception that they are actually *doing* something within the story context instead of merely observing); empathic responses to/identification with story characters is the key mechanism that generates user experience out of narrative content. For instance, a highly usable IS system with believable characters (such as in Figure 1) is likely to facilitate the perception of effectance (users become aware that they shape the story). From this perception, continuous interaction with the ongoing story may result in an experience of flow (Csikszentmihalyi, 1990) and curiosity about how one's current decisions will affect the course of upcoming events within the story. At the same time, appealing characters may evoke social-emotional responses in the user (empathy), which generates affective experience such as suspense in the case of the characters face a conflict or surprise if the (likeable) characters violate users' social expectations.

The model predicts connections between both mediator processes (effectance and empathy/identification) and all more specific user experiences such as suspense and flow. While conceptual arguments could be elaborated for each of these connections (e.g., Klimmt & Vorderer, 2003), the multiplicity of assumed effects is primarily intended to illustrate that a given IS system could elicit user responses through very different pathways. It is rather unlikely, in contrast, that one given IS

system will provide all the foreseen modes of enjoyment simultaneously. Empirical applications of the model may, however, falsify some of the proposed connections among mediator processes and types of user enjoyment, which would result in a “leaner” model structure.

With a forecast model of how interactive narrative may facilitate enjoyable user experiences, research on existing and future prototypes of this next generation entertainment media can be structured more effectively. The primary value of the model, however, will be its availability for a historic comparison of past expectations concerning the evolution of entertainment technology with what has actually hit the markets and has been adopted as mainstream entertainment in a few years. Maybe only some IS media will be enjoyable and successful with mass audiences that rely on one particular route or dimension of user experience as outlined in the model; maybe the model will fail completely to capture what kind of media entertainment will evolve out of the research and development laboratories where interactive narratives are designed. In any case, the elaboration of a forecast entertainment model from theory and expert inquiry equips technology-oriented entertainment researchers with a conceptual tool to ground their (theoretical and empirical) investigation of future media and to participate in ongoing development projects. One particularly promising topic of investigation in which the model may be helpful is the general design question about how and to which extent system authors should share control over story content with users (e.g., Murray, 1997). The inevitable tension between story coherence and meaningfulness on one hand and individual, dynamic user influences on the other hand may be resolved in very different ways. Research on user responses that is based on the proposed model could allow to find out about the consequences of particular strategies in dealing with the narration—interactivity dilemma in different prototypes and systems.

Such collaborations with technology institutions can also bring forward entertainment theory in respect to new highly interactive systems much earlier as entertainment research has typically responded to technological innovation in the past (e.g., video games). It will also allow communication scholars to enter an informed discussion with system inventors and designers about the user experience in future entertainment systems, with potentially positive outcomes in terms of design philosophy and overall entertainability of those media for the next generation of audiences striving for enjoyable experiences.

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